

THE GENUS *VERRUCISPOR*A GEN. NOV. (FUNGI IMPERFECTI)
ON PROTEACEAE IN NEW GUINEA AND QUEENSLAND

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(Plate VI)

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Synopsis

Verrucispora proteacearum gen. nov., sp. nov., is described on *Finschia chloroxantha* in New Guinea. It has also been recorded on *Hakea florulenta* in Queensland.

In 1959 the senior author collected a leaf spotting fungus on *Finschia chloroxantha* Diels at Mount Hagen, New Guinea. This was subsequently recorded as *Stenella* sp. (Shaw, 1963) on the advice of Dr. M. B. Ellis of the Commonwealth Mycological Institute. Recently a collection of a fungus parasitic on *Hakea florulenta* Meissn. in south-eastern Queensland (tentatively listed as *Heterosporium* sp. (Simmonds, 1966)) was forwarded to the C.M.I. for identification. In his report (personal communication, 1965) Dr. Ellis indicated that this fungus was very similar to that on *F. chloroxantha* from New Guinea, which he now considered would be better placed in a new genus. Comparison of specimens from both localities has revealed no great morphological differences, and the fungi are regarded as conspecific. A new genus is proposed to accommodate this fungus.

*VERRUCISPOR*A gen. nov.

Fungi Imperfecti, Hyphomycetes.

Mycelium immersum et superficiale, ex hyphis olivaceis ramosis laevibus septatis compositum. *Stromata* rufo-brunnea, ex hyphis dense intertextis in cavis substomatalibus compositum. *Conidiophora* ex stromatibus oriunda, fasciculata, fatula; simplicia, septata, primo recta, tandem geniculata.

Conidia apicalia cylindrica transverse multiseptata verrucosa, quasi inflatio supra apicem conidiophori oriunda.

Species Typica: *Verrucispora proteacearum* Shaw and Alcorn.

*VERRUCISPOR*A PROTEACEARUM sp. nov.

Mycelium 2–4 μ diam., stromata 25–50 μ diam. *Conidiophora* usque 40-nim fasciculata, basi densa subito late divergentia, simplicia valde septata septis usque 13, ubique aequabilia cicatricibus exceptis, primo recta tandem geniculata, apicibus pallidioribus exceptis aequae rufo-brunnea, usque 290 μ longa, 4.5–8.5 μ lata, interatim post delapsu conidiorum sub cicatrice apicale proliferantia, his proliferationibus quoad longitudine variabilibus; cicatricibus etiam variabilibus, circa 5. *Conidia* singula rufo-brunnea primo globosa tandem cylindrica obtusa, 3–7 septata ad septas interdum constricta, ante septas factas verrucosa, cellula basali per cicatricem conspicuam truncata interdum subconica, 23–51 $\mu \times$ 5.6–10.5 μ . *Habitat* in foliis vivis *Finschiae chloroxanthae* Dielsii in Nova Guinea, 21.VIII.59, D. E. Shaw, TPNG 2428 (IMI 77905), typus.

The mycelium is mainly immersed and ramifies through the host mesophyll. A very limited amount of growth over the leaf surface occurs. Hyphae are olivaceous, branched, smooth walled and septate. In the sub-stomatal region the hyphae aggregate into rounded stromatic bodies from the apices of which

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the conidiophores arise. The conidiophores emerge from the stomata in dense fascicles of up to 40 but are immediately widely divergent. They are simple, strongly septate (up to 13 septa), uniform in width except at scars, initially straight then becoming geniculate with sporulation, uniformly reddish brown except at paler apices, up to $290\ \mu$ long \times $4.5\text{--}8.5\ \mu$ wide. Prolongations originate just below the apical scar which then assumes a lateral position as the conidiophore grows. The length of each prolongation is variable, as is the number of scars (approximately 5). The conidia arise singly as blown out apices of conidiophores, and are at first globose, becoming elongated and roughened before the septa are visible. They are reddish brown, cylindrical with obtuse ends with the proximal cell truncated by a prominent scar and occasionally sub-conic, transversely multiseptate (3–7 septa), sometimes indented at septa, thick-walled, verrucose, and measure $23\text{--}51\ \mu \times 5.6\text{--}10.5\ \mu$ (Plate VI, Figs. 1–6).

Leaf spots on *Finschia* are up to 1.5 cm., amphigenous, round to angular, centre dark brown to black, margin lighter brown with irregular, slightly diffuse edge; especially on the lower surface velvety effuse to tufted black patches occur in the centres of the spots. On *Hakea* leaf spots are up to 1 cm., amphigenous, dark brown to black, rounded, irregular or dendritic with diffuse irregular margins. Fruiting occurs on both surfaces of the leaf. Cultures of the fungus have been obtained from both hosts, and pathogenicity towards its original host demonstrated for the *Hakea* isolate. On potato dextrose agar medium colonies are very slow growing, grey to black, raised and somewhat convoluted, sometimes with a narrow white margin, and usually imparting a yellowish tinge to the medium, which later becomes dark brown. Conidiophores and conidia are formed and are fairly typical of those seen on naturally infected leaves.

The colonies on *Finschia* are much more luxuriant than those on *Hakea*, which is probably a reflection of the different environments. At Mount Hagen (altitude 5,350 feet, latitude 6°S) the average annual rainfall is 103 inches, while at Beerwah (altitude 107 feet, latitude 27°S) it is 63 inches. The genus *Hakea* does not occur in New Guinea, and *Finschia* is not known from Australia.

The fungus under study differs from *Acroconidiella* (Lindquist and Alippi, 1964) which has single conidiophores arising from extensive superficial mycelium. *Heterosporium* Klotzsch was considered for the genus but de Vries (1952) has shown that the lectotype species, *H. ornithogali*, is a good *Cladosporium* with conidia in chains and protruding conidial scars, a deliberation which has been accepted by Hughes (1958), Barron and Busch (1962) and Dr. M. B. Ellis (personal communication).

As mentioned previously, the New Guinea fungus was first ascribed to *Stenella* by Dr. Ellis, but after subsequent study he considered that it would be better placed in a new genus. *Stenella* Syd., until recently a monotypic genus with *S. araguata* Syd. as the type species, has extensive superficial mycelium, short narrow conidiophores and small 0–2 septate rod-shaped conidia (Sydow, 1930) and the authors agree that the fungus cannot easily be ascribed to this genus as originally described. Although the genus *Stenella* has recently been widened on the advice of Dr. Ellis to include *S. tristaniae* Huguenin (Huguenin, 1965), the same authority considered (personal communication, 1966) that the fungus under study would still be better placed in a new genus rather than in *Stenella*. The fungus differs from *S. tristaniae** in the lack of superficial, branched, recumbent filaments forming a conidiferous layer, and of acrogenous secondary conidia.

Stenellopsis Huguenin* (Huguenin, 1965) forms conidia in a similar manner to *Verrucispora* but the development of the conidiophores from the stroma-like subepidermal aggregations differs. In the former genus the closely packed

* Authenticated specimen of *Stenella tristaniae* Huguenin (IMI 102775) and type of *Stenellopsis fagraeae* Huguenin (IMI 104087) have been examined through the courtesy of the Commonwealth Mycological Institute.

conidiophores burst through the epidermis in an erumpent mass, whereas in *Verrucispora* the conidiophores form in the stomata and emerge from them in fascicles. For this reason, and on Dr. Ellis's advice, the new genus is proposed for this species.

SPECIMENS EXAMINED

The following collections represent the distribution of this species as known at present.

Finschia chloroxantha TPNG 2428 (IMI 77905), 21·VIII·59, D. E. Shaw, Mount Hagen, New Guinea; TPNG 2586A (IMI 79045A), 19·XI·59, R. Smythe, Mount Hagen, New Guinea; TPNG 5151, 22·VII·66, K. J. White, Mount Hagen, New Guinea.

Hakea florulenta BRIP* 16731, 11·IX·65, J. L. Alcorn, Tewantin, Queensland; BRIP 16732 (IMI 116146), 20·IX·65, K. G. Pegg, Beerwah, Queensland; BRIP 16890, 27·XII·65, J. L. Alcorn, Beerwah, Queensland; BRIP 16894, 31·XII·65, J. L. Alcorn, Sunnybank, Queensland; BRIP 16955, 23·II·66, J. L. Alcorn, Beerwah, Queensland.

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EXPLANATION OF PLATE VI

Fig. 1

Fascicle of conidiophores emerging from stoma; some superficial mycelium also present. ×350.

Fig. 2

Young conidiophores emerging through stoma from sub-stomatal aggregation. ×1400.

Fig. 3

Conidia showing septation and slight indentation at some septa. ×650.

Fig. 4

Young conidia still attached to conidiophores. ×850.

Fig. 5

Conidiophore tip with five scars. ×1000.

Fig. 6

Surface view of verrucose conidia, showing proximal cell truncated by prominent scar. ×1000.

* BRIP—Plant Pathology Herbarium, Department of Primary Industries, Brisbane.